

## CLAIMS

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1. A hull (1) for a water craft, wherein the centre of gravity ( $C_g$ ) of the hull is substantially vertically aligned with the centre of hydrodynamic lift ( $C_p$ ) of a lifting surface of the hull, both at lift-off speed and at design speed; characterised in that the aspect ratio ( $S^2/A$ ) of the wetted hull (1) at design speed is in the range of 2.5 to 5.0.
2. A hull according to claim 1, wherein the centre of gravity ( $C_g$ ) and centre of hydrodynamic lift ( $C_p$ ) are substantially vertically aligned at all hull speeds between lift-off and design speed and above.
3. A hull according to claim 1 or claim 2, wherein the centre of gravity ( $C_g$ ) and centre of hydrodynamic lift are also substantially vertically aligned at hull speeds below liftoff.
4. A hull according to any one of claims 1 to 3, wherein the aspect ratio ( $S^2/A$ ) of the hull (1) at lift-off speed is in the range of 1.5 to 2.5.
5. A hull according to any preceding claim, wherein a leading edge (28) of the wetted area of the hull (1) at design speed is generally transverse to the direction of forward movement of the hull along at least a portion (12) of its length, whereby a spray sheet (26) which may be created by the hull, in use thereof, is projected generally forwards such that the craft rides over the spray sheet.
6. A hull according to claim 5, wherein the leading edge (28) of the wetted area of the hull at design speed is generally transverse to the direction of forward movement of the hull along at least a substantial portion (12) of its length.
7. A hull according to any preceding claim, wherein the hull (1) is of generally delta-shape in plan view, comprising a central portion (1a) and two side wing portions (1b, 1c).
8. A hull according to claim 7, wherein each side wing portion (1b, 1c) extends laterally and rearwardly from the central portion (1a) so as to define an open area (5) therebetween, adjacent a transom (3) of the central portion of the hull.

5

9. A hull according to claim 8, wherein the hull (1) additionally includes a cover portion for covering this open area.

10. A hull according to claim 8 or claim 9, wherein the hull is provided with two propellers (22, 22a) attached to the transom (3) of the central portion of the hull.

11. A hull according to any of claims 8 to 10, further including an abruptly downswept trailing edge portion.

12. A hull according to claim 11, wherein said trailing edge portion is integrally formed in the hull.

13. A hull according to claim 11, wherein said trailing edge portion is provided in the form of a rear flap means (20) affixed to a trailing end of the hull, the flap means projecting generally downwardly from the hull at an angle of greater than 45 degrees to the free water surface (2<sub>1</sub>), at design conditions.

14. A hull according to claim 13, wherein the flap means projects generally downwardly from the hull at an angle of substantially 90 degrees.

15. A hull according to claim 13 or claim 14, wherein said flap means extends over the full width of the transom of the central portion of the hull and also extends across the full length of inner (6b, 6c) and trailing (7b, 7c) edges of each side wing portion (1b, 1c) defining the open area (5) at the rear of the hull (1).

16. A hull according to any of claims 13 to 15, wherein the chord of the flap means is variable.

17. A hull according to claim 21, wherein the chord of the flap means at the transom (3) of the central portion (1a) of the hull is independently variable of the chord of the flap means at the inner and trailing edges of the wing portions.

18. A hull according to any of claims 7 to 17, wherein the central portion (1a) of the hull includes a nose portion (1c) which comprises a forward surface extending rearwardly and downwardly from a nose of the hull towards a trailing end portion of the central

- portion of the hull, is lightly cambered in longitudinal section thereof such that the angle (of said forward surface relative to the water surface, in uses of the hull, is progressively reduced along the length of said nose portion towards said trailing end portion of the hull.

19. A hull according to any of claims 7 to 18, wherein each side wing portion (1b,1c) is lightly cambered in transverse cross-section thereof such that the angle of an underside (50b,50c) of each side wing portion relative to the water surface is progressively reduced from a tip (10b,10c) of the wing portion, along the transverse width of the wing portion, towards the central portion (1a) of the hull (1).

20. A hull according to claim 19, wherein each side wing portion (1b,1c) is also similarly lightly cambered in longitudinal section thereof.

21. A hull according to any of claims 7 to 20, wherein each side wing portion (1b,1c) has an underside portion which is inclined to an underside (36) of the central portion (1a) of the hull at an angle (A) which is in the range of 2 to 10 degrees.

22. A hull according to any preceding claim, further including a keel (50) extending downwardly from an underside of the hull and which is formed and arranged so that the centre of lateral resistance of the keel (50) is substantially vertically aligned with the centre of gravity ( $C_g$ ) of the hull.

23. A hull according to claim 22, wherein said keel (50) is retractable.

24. A water craft incorporating a hull (1) according to any preceding claim.

25. A water craft according to claim 24, wherein the hull (1) is formed and arranged such that, if the craft pitches such that the bow (32) of the craft raises, the hydrodynamic centre of lift ( $C_p$ ) of a lifting surface of the hull moves sharply rearwards as the stern of the craft becomes immersed.

26. A water craft according to claim 25, wherein the hull (1) is also formed and arranged such that if the craft pitches such that the bow (32) of the craft lowers, the hydrodynamic centre of lift ( $C_p$ ) of said lifting surface of the hull moves sharply forwards.